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Differences between spelling-to-sound correspondences for reading and sound-to-spelling correspondences for writing are discussed in terms of the characteristics of and the relationships between stimuli and responses. While dialect variation can be accommodated in reading, it cannot be accommodated in spelling, where no response variation is permitted. Correspondences are not generally reversible, and complementary correspondences differ in complexity. Implications for the design of a spelling component within a unified communication skills program are presented. (Author)

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Differences between spelling-to-sound correspondences for reading and sound-to-spelling correspondences for writing are discussed in terms of the characteristics of and the relationships between stimuli and responses. While dialect variation can be accommodated in reading, it cannot be accommodated in spelling, where no response variation is permitted. Correspondences are not generally reversible, and complementary correspondences differ in complexity. Implications for the design of a spelling component within a unified communication skills program are presented.

SPELLING-TO-SOUND CORRESPONDENCES FOR READING VS. SOUND-TO-SPELLING CORRESPONDENCES FOR WRITING

In a unified, phonics-based communication skills program, one might expect a close relationship between reading and spelling instruction. In reading, the printed letters correspond to sounds; in spelling, the sounds correspond to written or printed letters. Although there are similarities between these correspondences, it is important to determine where spelling-to-sound correspondences (reading) differ from sound-to-spelling correspondences (writing); and further to determine their pedagogical significance. Descriptions of the spelling-to-sound correspondences underlying this paper are found in Berdiansky, Cronnell, & Koehler (1969); Cronnell (1971); Venezky (1970). Sound-to-spelling correspondences are described in Hanna, Hanna, Hodges, & Rudorf (1966). For puposes of the present paper the differences identified may be conveniently classified in one of the following three categories: (1) stimulus and response characteristics, (2) permissible variability, and (3) reversibility and degree of complexity.

Stimulus and response characteristics

Reading consists of interpreting printed or written symbols. These symbols are concrete, relatively permanent, with fairly easily defined physical characteristics. The stimuli for spelling, on the other hand, are speech sounds (including words), which, while quite real, are much less concrete. Although all sounds can be described with some precision by trained phoneticians and physicists, they are much less "tangible" and much more evanescent for the untrained reader, and probably even more so for children.

In reading, the written symbols can be easily isolated and studied in detail. Speech sounds are much more difficult to isolate and study, and thus, as stimuli, present greater difficulty for the speller. While children apparently come to school with sufficient ability to discriminate between and among written stimuli, they do not have comparable ability on the speech level (Calfee, Chapman, & Venezky, 1970).

There are approximately 40 distinctive sounds in English. The precise number varies, depending on the analysis used and the dialect studied. While the English alphabet has only 26 letters, the letters can be combined in various ways to give a total of approximately 70 letters and letter combinations (see Berdiansky et al., 1969; Cronnell, in press). Thus, reading moves from many stimuli to fewer responses (70 letters or letter combinations to 40 sounds, e.g., d → [d], dd → [d]), while spelling moves in the opposite direction, from a smaller set of stimuli to a larger set of responses (e.g., [d] → d or dd).

Related to these stimulus and response factors are the differences between homographs and homophones in English. A homograph is one spelling with two pronunciations and meanings (e.g., read, live, convict); Whitford (1966) identifies 160 homographs in English. A homophone is one pronunciation with two or more spellings and meanings (e.g., dear-deer, to-too-two, son-sun); Whitford (1966) identifies 1800 English homophone pairs. Homographs are a relatively insignificant problem in reading because of their small number, and homophones may be an aid in reading, serving to distinguish words which are not distinguished in speech (see Bradley, 1914). However, homophones represent considerable spelling difficulty, especially because of the rather large number involved.

Permissible Variability

Considerable variation is allowed in the pronunciation of English words, some of which is not even noted by native speakers of English (as either speakers or hearers). Some variation is on the word level, some on a broader phonological basis; variation may be idiolectal or dialectal.

On the word level, some variation is so common that it probably goes unnoticed by most people, e.g., catch ([æ] or [ɛ]), greasy ([s] or [z]), root ([ʊ] or [u]). Other variations, while more noticeable to those who do not use them, are generally accepted (although perhaps with dislike); e.g., for most Americans the words either and neither pronounced with [ay] and vase pronounced [vaz] sound strange (and may be laughed at), but are usually tolerated.

Even more variation is found affecting whole classes of words as a result of more general phonological rules. Many Americans do not contrast between [a] and [ɔ] (cot and caught) and between [w] and [hw] (wine and whine). It appears that speakers who do not use the contrasts often do not hear them when spoken by others, and speakers who do use the contrasts often do not notice the lack of contrast in others. Nonetheless, there are some general phonological variations which seem to be more noticeable; e.g., a majority of Americans are cognizant of "r-less" dialects, where pa-par and saw-soar are homophones. Yet such differences are at least tolerated, if not accepted. Over the past decade there has been little objection from most of the electorate to the speech (although not the speeches) of such linguistically disparate presidents as Kennedy, Johnson, and Nixon.

It is quite a different matter when spelling is in question; the attitude is quite simple: variation in spelling is not permissible. While Americans generally allow the English their few variant spellings and vice versa, chauvinism does not permit "foreign" spellings in either the classroom or the printing industry (see Menken, 1936, 1948). Other than national differences, there are very few permissible variant

spellings in English (e.g., gray-grey), with the exception of trade names (e.g., Kool, Sunkist, cf, Praninskas, 1968, especially chapter 2) and proper names (e.g., Catharine-Catherine-Cathryn-Katharine-Katherine-Kathryn, Barbara-Barbra), but these are of little importance in spelling instruction.

English spelling has not always been so inflexible (see Vallins, 1965, especially chapter 4, for an interesting and informative description of past spelling practices). However, with the rather minor exceptions noted above, English spelling today is rigidly fixed. Moreover, incorrect spelling is generally considered an indication of ignorance, bad manners, and all sorts of other horrors. The fixing of spelling accompanied long-past cultural and mechanical changes (particularly the rise of the middle class and the development of printing). Today the emphasis on correct spelling is pervasive. The schools, as guardians and perpetuators of society, have become particularly strong proponents of correct spelling. A published spelling series (Monroe, Aaron, & Schiller, 1969, Book 1) desires to instill "an attitude of respect for correct spelling" (p. iii) because "correct spelling is one of the essential skills in written communication" and "a sign of *intellectual and social competence*" (p. viii, italics added). In short, spelling is an area where creativity and individual differences are not at all allowed.

Since it is doubtful that English spelling can be readily or reasonably changed to a great degree, it might be hoped that more tolerant news of deviancy in spelling could be encouraged. (We encourage tolerance of racial, religious, physical, and other human differences, why not spelling differences?) We might also hope and try to change teachers so that variation in spelling is at least understood. Some teachers already allow students free expression without undue emphasis on correct spelling (or grammar). This does not necessarily mean approval of variant spellings; invariance undoubtedly makes things easier for the reader.

An important part of the design and implementation of a spelling program should be sufficient teacher awareness of English spelling to understand variants. For example, cum is a reasonable spelling of [kəm] (come) according to regular spelling rules, but cam or kam or kum or kome as spellings of [kəm] violate normal sound-to-spelling correspondences. While a teacher can accept none of these spellings, it should be realized that cum indicates a knowledge of English spelling patterns (although applied to a word in which they do not hold), while the other spellings indicate a serious deficiency in spelling ability. The writer of the former should be encouraged for trying to use the regularities of the language (and corrected--with explanation--on this irregular word), while the writer of the latter needs considerable remedial work.

It should be noted that speech variation is accepted without creating difficulty in reading, but spelling variation is not accepted although

tolerance is needed. It appears that spelling-to-sound correspondences for reading can accomodate considerable dialect variation with little modification (Chomsky & Halle, 1968; Fasold, 1969; Pfaff & Tinnie, 1970). On the other hand, sound-to-spelling correspondences may need to be modified considerably to account for various dialect differences, which can definitely affect spelling (Boiarsky, 1969; Graham & Rudorf, 1970).

Reversibility and degree of complexity

At first glance, it may appear that the relationships between pronunciation and orthography (sounds and letters) are reversible. However, closer analysis indicates that it is generally not possible to reverse these correspondences in a strict one-to-one fashion.

Sometimes spelling is easier than reading, e.g., there are two major pronunciations of th (/ð/ and /θ/ as in this and thing) and a number of exceptions (as in Thomas and asthma), but the two sounds /ð/ and /θ/ are invariantly spelled th. For the most part, however, spelling is much more complex than reading. For example, the pronunciation of k is simply defined: It is not pronounced initially before n (as a knee); otherwise it is pronounced /k/. Writing is more complicated: to spell initial "silent" k it is necessary to memorize all words in which this occurs; the spelling k for /k/ can only be defined by specifying rather complex environments (e.g., before e, i, and le; after a consonant, a long vowel or a vowel digraph), and even then there are numerous exceptions.

The lack of complete reversibility between correspondences for reading and writing means that a spelling program, while closely related to the reading component, cannot simply be the converse of it. Moreover, the generally greater complexity of spelling requires careful construction of any spelling program, as well as greater emphasis on such programs in classrooms.

Conclusion

There are considerable differences between spelling-to-sound correspondences for reading and sound-to-spelling correspondences for writing. These differences have significant implications for the design of a spelling component within a unified communication skills program. Careful consideration of both differences and similarities is essential if spelling instruction is to be improved.

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